



EUROPEAN UNION



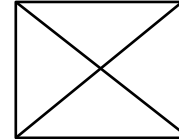
GOVERNMENT OF ROMANIA



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Structural Funds  
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## Romania - Republic of Serbia IPA Cross-border Cooperation Programme

# ASPECTS REGARDING MECHANIZED BRAZING PROCESSES

PhD. Eng. BINCHICIU HORIA

Prof. PhD. Eng. FLESER TRAIAN

Prof. PhD. Eng. VOICULESCU IONELIA

PhD. Student Eng. BINCHICIU EMILIA



**Romania-Serbia**

Common borders. Common solutions.

# RECOMANDATIONS

Brazing mechanization processes differ function to the production type;

- Series production is recommended to be made in the oven, with predesigned materials, type:
  - CuP rings (a)
  - sandwich sheets (b)



- Composite type: pickled brazing alloy, powder or paste
- Unique or small series production is recommended to be obtained through brazing with tubular wire or covered rods.

## ASPECTS ON ADDITION MATERIALS

- Choosing brazing materials is made function to the base materials that compete at developing joints and the process that is applied;
- Alloys and deoxidizing flux, widely use, are standardized through EN 1044/1999 and EN 1045/2002. In order to adapt and optimize brazing processes, function to the structure to accomplish, we added specialized powder precursors in the brazing material;



## EXPERIMENTS

Experiments to obtain brazing materials.

1. Composite, type, mechanical powder mix AG105, according to EN 1044, with a volume participation of 60%, with a FH10 flux , according to EN 1045, with a participation of 40%.
2. Tubular wire made out of a AG105 tube and an FH10 middle, with AG105 powder addition, with a filling coefficient of 0,5.



## BRAZING PROCESSES

In current practice we use a large range of brazing processes, classified function to the energy carrier.

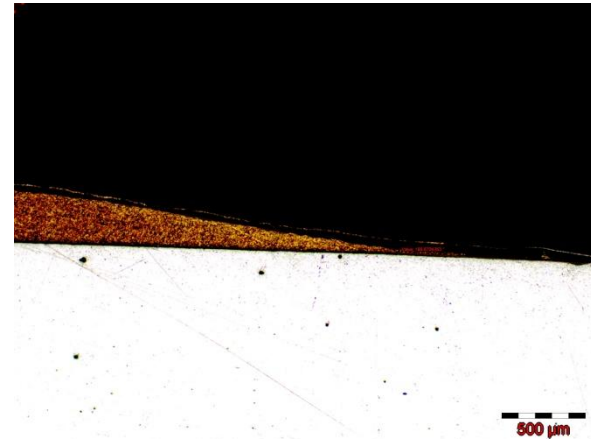
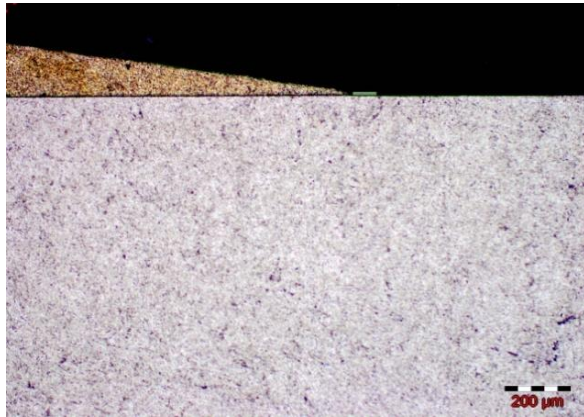
Experiments done by the papers authors have been developing in two directions, namely:

- Brazing in the oven of the asphalt cutting knives.
- Flame brazing with tubular wire of copper joints, type pipe in pipe.



# BRAZING MATERIALS CHARACTERIZATION

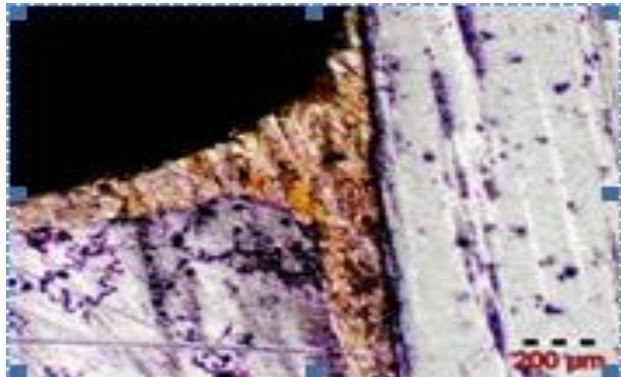
Name		Chemical composition in mass %				
<b>SR EN</b>		Ag	Cu	Zn	Cd	Altele
<b>1044:1999</b>		Min-max	Min-max	Min-max	Min-max	Min-max
<b>AG105</b>	prescribed	39,0-41,0	29,0-31,0	26,0-30,0	--	Sn 1,5-2,5
	determined	40,5	29,2	28,2	--	Sn 2,1



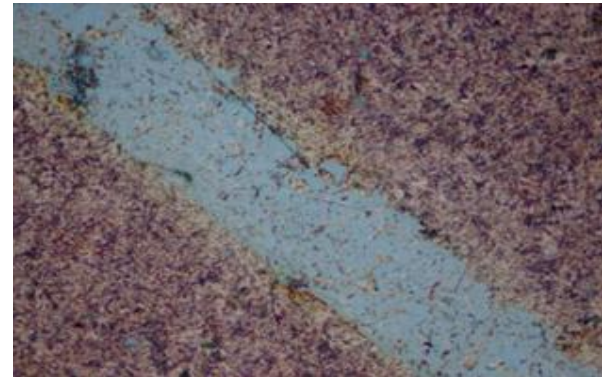
Moistening angle  $9,986^\circ$  (steel) and  $6,670^\circ$  (copper)

# JOINT CHARACTERIZATION

- Reinforcement made out of sintered tungsten carbide in a steel alloyed with 2% Cr stand;
- Pipe in pipe joint - Cu



250x



# Conclusions

- Research led to two specialized mechanized brazing materials and series developing technologies for cutting knives, namely pipe in pipe joints, used in the cold industry.
- The results selectively presented are part of research done for the PhD. School of “Politehnic” University Timisoara and SUDOTIM Timisoara.
- The research conducted is a part of MATFREZ - HIGH PERFORMANCE MATERIALS AND TECHNOLOGIES FATED FOR THE REALIZATION OF THE KNIFES OF MILL FOR ASPHALT - CONTRACT PCCA Tipe 2 no. 188/2012.



**Thank you for your attention!**

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